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SOVIET ELECTRIC POWER STATIONS
AND SYSTEMS IMPROVE OPERATIONS

Soviet power engineers have recently achieved great successes. The Ministry of Electric Power Stations, on the whole, completed its plan for production of electricity in 1949 on 29 December and in the fourth quarter of 1949 was producing electricity at a rate which was planned for 1950. In the first 10 months of 1950, the plan for production of electric power was exceeded, but was only 99 percent completed in the third quarter. This deficiency should be wiped out in the fourth quarter.

In 1949, average fuel consumption was reduced by more than 3 percent over 1948, a fact which represents a greater gain in fuel economy than in any single prewar or postwar year. The plan for further reducing fuel consumption in 1950 is being exceeded. Loss of electricity in the networks was considerably decreased, and the quality and efficiency of capital and periodic repair of equipment was considerably improved.

The electric power stations and networks saved 350 million rubles above plan in 1949, and production costs per kilowatt-hour of electrical energy exceeded the Five-Year Plan for 1950. At the same time, production costs of electrical energy continued to decrease. These successes would have been considerably greater if all existing possibilities had been timely and fully utilized.

Soviet power engineering has achieved a high level of technical development in recent, especially postwar, years. Utilization of larger turbines and boilers has made possible higher power capacities than with previously used equipment. Equipment for high parametric steam is widely utilized and the installed capacity using high pressure already makes up 15 percent of the average capacity of the steam-electric power plants.

Automatization of the main productional processes in the electric power stations and networks is widely developed. Of all the steam produced, 37.6 percent is made in boiler aggregates with automatically controlled combustion. While 44.3 percent of the total installed capacity is automatically controlled, 19.7 percent is controlled by remote control.

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Many electric power stations are equipped with mechanized ash removal systems and highly productive machines for loading and unloading in the fuel storage areas. The technical level of existing equipment is improved by annually reconditioning this equipment.

However, the high technical improvements described above are not completely realized. Many high-pressure electric power stations which should have consumed 430-440 grams of fuel per kilowatt-hour of electric power, actually consumed 450-470 grams per kilowatt-hour in the first 6 months of 1950. One stations which should have consumed 460-470 grams per kilowatt-hour, actually consumed 475-540 grams per kilowatt-hour in the first half of 1950.

The main reasons these technical improvements are not utilized, are that the defects in the steam systems and equipment are eliminated too slowly, and because of backward operation. Thus, the Stalinogorsk GRES had 23 boiler shutdowns in 1949 because of faulty water economizers and nine shutdowns because of leaks and defects in the shutoff fixtures and flanges. The boilers were not efficiently operated. Boilers No 2-5 were operated with too much air in the fire chamber ($\alpha = 1.4-1.45$) for the amount of slag formation. Air intakes operated at 75-95 percent efficiency in the boilers until they underwent capital repair. The turbine condenser pipes were obstructed and the high-pressure preheaters frequently broke down because of flaws in the welded seams of the pipe clusters. In 1950, the electric power stations improved operations somewhat but a considerable number of the deficiencies remained.

A high accident rate plagued the Kuyakhovka GRES. In the first 6 months of 1950, there were four accidental boiler shutdowns because of breaks in the steam superheaters and one shutdown because of an explosion in the dust-removal (pylesistem) system. There were also nine accidental turbogenerator shutdowns, mainly because of improper operation.

Average and low-pressure electric power stations were operated for a much longer time than the high-pressure stations, but they too did not take full advantage of all the improved technical-economical processes. An analysis of their operations in 1949 and the first 6 months of 1950 showed that it was possible to increase the efficiency of the boilers 1-5 percent, turbines 0.5-1.5 percent, and steam ducts 0.5-3 percent by improving operating methods. Even such stations as the Sredne-Ural'sk and Kemerovo GRES, which have high technical-economical indexes, could show improvement.

To further expand advanced technical improvements, the various electric power stations and systems should exchange ideas and experiences. For example, much can be learned from the Sredne-Ural'sk, Kemerovo, and Yaroslavl' GRES when it comes to proper utilization of boiler equipment; from TETs No 11 of Mosenergo and Zakamskiy TETs when it comes to repairing equipment; and from the Yaroslavl' TETs, Ivanovo TETs, and GRES imeni Krasina and others when it comes to providing for a low accident rate of equipment.

Frequently, the experiences of enterprises in one or another electric system are not known or utilized in other systems. Therefore, it is the urgent task of the technical divisions of the main administrations, the All-Union Thermal Electric Technical Institute, the Central Scientific Research Electrical Engineering Laboratory, the State Trust for the Organization of Regional Electric Power Stations and Networks, and the All-Union Electric Power Systems Repair Trust to distribute the successful experiences of the more advanced electric systems. Some work of a similar nature has already been accomplished. For example, the Ministry of Electric Power Stations called an all-Union meeting for the purposed of exchanging ideas on the efficient repair of equipment and widely distributed the conclusions of the meeting. The ministry also published an information letter on the experiences of TETs No 11 of Mosenergo which achieved good indexes in equipment repair.

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All main administrations should follow the example of Glavtsentenergo (Main Administration of Central Electric Power System) which called a meeting of its nine electric power systems. At the meeting, it was pointed out that although indexes for continual operation of equipment were generally unsatisfactory, some stations showed very good indexes. For example, 15 fuel-conveyer shops worked continuously for 19 to 122 months, ten boiler shops from 11 to 103 months, and nine turbine shops from 19 to 132 months. Other enterprises could benefit by the experiences and methods of these shops.

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